

REMARKS

This Amendment is responsive to the Office Action dated August 1, 2003. In this Amendment, Applicants have amended claims 1, 6, 15, 17, 18, 26 and 31. Applicants have also added new claims 41-43. Claims 1 and 26 are amended for purposes of enhanced clarity. Claim 15 is amended to correct a typographical error. Claims 6, 17, 18, and 31 are amended to correct inadvertent errors. Claims 1-43 are now pending.

Provisional Obviousness-type Double Patenting

In the Office Action, the Examiner provisionally rejected claims 1-40 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-42 of copending application no. 09/778,704. At this time, Applicants respectfully traverse this rejection, but reserve comment in view of the provisional status of the rejection.

Rejection under 35 U.S.C. § 112, first paragraph

The Examiner rejected claims 6-8, 17-20, and 31-33 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner further stated that the "specification/disclosure does not provide support for [the features] recited in amended claims 6-8, 17-20, 31-33 as a whole how to make or use applicant's claimed invention."

In light of the Examiner's comments, it appears that the rejection is based on lack of both adequate written support and enabling disclosure. In support of the rejection, the Examiner stated that:

The effect of placing the green and blue values shifted from the color value of the selected green element with display device is not disclosed in specification. No working examples disclosing the necessary parameters have been provided.

Without this disclosure, one skilled in the art cannot practice the invention without undue experimentation because of uncertainty of placing the green and blue values shifted from the color value of the selected green element with display device (emphasis added).

The Examiner's comments appear to highlight an inadvertent discrepancy in previously amended claims 6-8, 17-19, and 31-33. In particular, claims 6, 17 and 31 inadvertently referred to displaying a plurality of red-blue shifted gray elements having a green value substantially equal to the color value of the selected green element and green and blue values shifted from the color value of the selected green element with the display device. In light of Applicants' disclosure, the reference to the shifting of green values was obviously in error.

The claimed invention should correctly refer instead to red-blue shifted gray elements with red (not green) and blue values shifted from the color value of the selected green element. In this Amendment, Applicants have amended claims 6, 17, 18 and 31 to correctly refer to the display of red-blue shifted gray elements having red and blue values shifted from the color value of the selected green element, and apologize for any confusion the previous amendment may have caused. In view of this Amendment, Applicants respectfully submit that amended claims 6-8, 17-19, and 31-33 conform to the requirements of 35 U.S.C. § 112, first paragraph.

Applicants' specification, as originally filed, clearly and adequately describes embodiments of the invention set forth in amended claims 6-8, 17-19 and 31-33. For example, to determine gray balance, a color profile server serves a web page that displays a plurality of RGB, i.e., "gray," patches. Page 35, lines 4-5. Each gray patch has the same value of green selected in a previous fine gamma determination. Page 35, lines 5-8. However, the gray patches have values of red and blue that are substantially equal to or systematically shifted from the previously selected value of green. Page 35, lines 5-8. The gray patches are displayed against a gray background that is dithered in the same manner as a green dithered background used in the fine gamma determination. Page 35, lines 8-10. The user selects the gray patch that appears to most closely blend with the gray dithered background. Page 35, lines 13-14.

Notably, the gray patches have plus/minus differences in red and blue about the value of a central gray patch. Page 35, lines 18-21. The central gray patch has a value of green selected in a fine gamma process, along with substantially identical values of red and blue. Page 35, lines 18-24. Hence, every patch in the resulting gray balance array carries the same green value, but is modulated by different gradations of red and blue. Page 35, lines 25-30. This step eliminates one axis of variation, green, but permits identification of any imbalance between red and green or between blue and green. Page 35, lines 28-30. The effect is to limit the range of choices to a

more finely-tuned area, and aid the user in making a more accurate selection for the gray balance determination. Page 35, lines 28-31.

The range of gray patches may be a two-dimensional array of patches with red-blue-shifted patches arranged around a central gray patch. Page 36, lines 1-3. FIG. 11 shows a five-by-five matrix containing gray patches for selection by the user. Page 36, lines 8-9. Each gray patch represents a shift away from the central gray patch along either blue axis, the red axis, or a combination of both. Page 36, lines 9-11. In some embodiments, all patches may have identical values of L^* , but different values of a^* and b^* to reflect shifts along the red axis or blue axis. Page 36, lines 18-20.

For example, the shifts may be on the order of plus/minus $3 \Delta E$ in a^* and b^* for patches that immediately surround the central patch, and plus/minus $6 \Delta E$ for patches around the outer perimeter of the array, relative to the a^* and b^* values of the central patch. Page 36, lines 18-27. Alternatively, for simplicity, the variations in red and blue may be a fixed plus/minus amount of 5 gray levels and 10 gray levels. In either case, a central gray element having red, green and blue values substantially equal to the color value of the selected green element is displayed in conjunction with a plurality of red-blue shifted gray elements having a green value substantially equal to the color value of the selected green element, but red and blue values shifted from the color value of the selected green element.

Applicants respectfully submit that the disclosure, as evidenced by the passages noted above, makes clear that Applicants were in possession of the invention as claimed at the time the application was filed. Moreover, one of ordinary skill in the art would have no difficulty making and using the claimed invention, given the extensive content of Applicants' disclosure with respect to the display of red-blue shifted gray elements.

The "effect" of the limitations of the claimed invention, to the extent it may bear on the written description and enablement requirements of 35 U.S.C. § 112, first paragraph, is clearly conveyed by the specification. For example, the features of amended claims 6-8, 17-20, and 31-33 may permit a user to accurately estimate the gray balance of a display device with greater ease by displaying gray patches that differ slightly along the red and blue axes in order to uncover red and blue imbalance. See, e.g., page 35, lines 24-31.

In addition, Applicants respectfully submit that the specification clearly conveys the details necessary for one of ordinary skill in the art to make and use the invention of amended claims 6-8, 17-19, and 31-33. The Examiner stated that "no working examples disclosing the necessary parameters have been provided." Applicants respectfully submit that there is no requirement for "working examples" under 35 U.S.C. § 112, first paragraph. Rather, it is sufficient that the specification convey sufficient details to enable one skilled in the art to make and use the claimed invention without undue experimentation. In accordance with 35 U.S.C. § 112, first paragraph, Applicant's specification describes the formulation of red-blue shifted color elements in detail. Moreover, contrary to the Examiner's assertion, Applicant's specification does include specific examples of gradations, i.e., shifts, to be made in the red-blue shifted color elements. See, e.g., page 36, lines 15-27.

In view of the amendments to claims 6, 17, 18 and 31, and the extensive content of Applicants' disclosure relative to the limitations set forth in those claims, Applicants respectfully submit that the disclosure and claims satisfy the requirements of 35 U.S.C. § 112, first paragraph, and request withdrawal of this rejection.

Claim Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1, 4, 5, 9, 10, 13, 26, 29, 30, 35, and 38 under 35 U.S.C. § 103(a) as being unpatentable over Engeldrum et al. in view of Schonenberg et al.; rejected claims 9 and 34 under 35 U.S.C. § 103(a) as being unpatentable over Engeldrum et al. in view of Schonenberg et al. and Hill et al.; rejected claims 2, 3, 11, 12, 15, 16, 21-25, 27, 28, 36 and 37 under 35 U.S.C. § 103(a) as being unpatentable over Engeldrum et al. in view of Schonenberg et al. and Seegers et al.; rejected claim 23 under 35 U.S.C. § 103(a) as being unpatentable over Engeldrum et al. in view of Schonenberg et al., Seegers et al. and Hill et al.; and rejected claims 14, 39, and 40 under 35 U.S.C. § 103(a) as being unpatentable over Engeldrum et al. in view of Schonenberg et al. and Graf et al.

Applicants respectfully traverse these rejections. The claimed invention, as recited in amended independent claims 1 and 26, for example, requires:

- estimation of an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background;

- characterization of overall gamma for red, blue, and green channels of the display device based on the estimated initial gamma; and
- modification of the overall gamma based on a gray balance evaluation for the red and blue color channels.

Similarly, the system of claim 15 requires a color profile server to obtain information characterizing the color responses of display devices, wherein the information includes an initial gamma determined based on selection of a display green element that appears to most closely blend with a dithered green background, and an overall gamma for red, blue, and green channels determined from modification of the initial gamma based on a gray balance evaluation for the red and blue color channels.

Hence, in accordance with the claimed invention, the green element that most closely blends with a dithered green background is used to estimate an initial gamma. The estimated initial gamma is used to characterize overall gamma for not only the green channel, but also the red and blue channels. Finally, a gray balance evaluation of the red and blue channels serves as a basis for modification of the overall gamma.

None of the prior art of record, taken alone or in combination, provides any teaching that would have suggested such features. Applicants address below the shortcomings of the prior art relative to each of the limitations set forth in amended claims 1, 15, and 26.

characterization of overall gamma for R, B and G based on estimated initial gamma

Applicants maintain that Engeldrum et al. fails to disclose characterization of overall gamma for red, green and blue channels based on an initial gamma that is estimated based on selection of a displayed green element that appears to most closely blend with a dithered green background. In support of the rejections, the Examiner essentially repeated his analysis with respect to Engeldrum et al. as set forth in the previous Office Action dated October, 24, 2002. Unfortunately, the Examiner failed to respond to the arguments raised by Applicants, in the Amendment filed January 17, 2003, against the Examiner's reliance on Engeldrum et al. Applicants previously pointed out basic errors in the Examiner's characterization of the Engeldrum et al. teachings, yet the Examiner made no mention of them in the present Office Action.

In particular, the Examiner seemed to ignore the fact that Engeldrum et al. does not disclose characterization of an overall gamma for the red, blue, and green channels based on the gamma estimated from the green element, as set forth in the claims. Once again, the Examiner referred to FIG. 5, and Col. 3, lines 50-63, of Engeldrum et al. as describing an overall gamma for the red, blue and green channels, and modification of overall gamma based on a gray balance evaluation for the red and blue channels. Yet Applicants can find nothing of this sort in the passage identified by the Examiner. On the contrary, in the precise section cited by the Examiner, Engeldrum et al. very plainly teaches that "separate gamma . . . determinations are performed for red, green and blue components" (emphasis added). Engeldrum et al., Col. 3, lines 53-56.

Consequently, it is clear from the specific passages cited by the Examiner that Engeldrum et al. does not disclose determination of overall gamma for the red, blue and green channels, but rather separate gammas. In other words, Engeldrum et al. describes the determination of an individual, separate gamma for each color channel, rather than a common, overall gamma that applies to all color channels. This difference is directly contrary to a basic requirement of Applicants' claims, and was not addressed by the Examiner despite Applicants' previous efforts to highlight it. Engeldrum et al. simply does not suggest characterization of overall gamma for red, blue, and green based on the gamma estimated from the green element, and the Examiner cited no additional prior art teaching that would have suggested the desirability of modification of Engeldrum et al. to incorporate such a feature.

In view of this difference alone, Applicants maintain that the rejection is improper and should be withdrawn. The Examiner has failed to point to any substantial evidence in the record to support the teaching attributed to Engeldrum et al., and therefore has failed to establish a prima facie case of obviousness.

estimation of an initial gamma based on selection of a displayed green element that appears to most closely blend with a dithered green background

In addition to the shortcomings discussed above, neither Engeldrum et al. nor the additional references cited by the Examiner supports a prima facie case of unpatentability with respect to other limitations expressed by the claims. The newly cited Schoenenberg et al. reference, for example, provides no teaching that would have suggested the desirability of

modification of Engeldrum et al. to arrive at the claimed invention. In particular, Schoenenberg et al. fails to provide any teaching that would have suggested estimation of an initial gamma based on selection of a displayed green element that appears to most closely blend with a dithered green background.

In his analysis, the Examiner acknowledged that Engeldrum et al. fails to teach estimating an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background. However, the Examiner cited Schoenenberg et al. as teaching definition of "a minimum (initial) requirement for intensity done with the green color on green background."

It is unclear how this aspect of the Schoenenberg reference relates to any of the requirements of Applicants' claims. Unfortunately, the Examiner did not explain how such a teaching in Schoenenberg et al. would have suggested the desirability of modification of Engeldrum et al. to estimate an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background.

Schoenenberg et al. provides no teaching even remotely pertinent to this requirement of Applicants' claims. Accordingly, the Examiner has misinterpreted the scope and content of the Schoenenberg et al. reference. Schoenenberg et al. focuses on the determination of reference values, such as white reference or black reference, for background color in an image obtained by scanning a document. The reference values specify the background color of a print medium, such as paper, on which the image is formed. Upon scanning the image from paper, it is important to evaluate the white reference value in order to account for variation in paper color, which may be caused by different materials, different printing processes, or aging.

As explained by Schoenenberg et al., the effect of determining the white reference is that "a scanned point having a light color tint the shade of which visibly deviates from that of the average background tint (and hence from the then valid white reference) is not considered as white, but as a color." Col. 3, lines 31-36. In this manner, the Schoenberg et al. reference seeks to avoid the unnecessary activation of under color removal (UCR) techniques merely to reproduce a background color that was intended to be white, but which may have yellowed due to aging. Col. 1, lines 30-45.

Schoenenberg et al. generally describes techniques for evaluating scanned points to determine whether the points represent merely background colors or legitimate color information. To that end, Schoenenberg et al. compares each scanned point to a locally valid reference value, such as a white reference. At Col. 19, lines 15-33, Schoenenberg et al. points out that the disclosed techniques may be applied to determine not only a white reference, but alternatively a black reference or even a green reference in the event a scanned image is printed on a document with a green background color. Once again, the goal is to distinguish scanned points representing color values from scanned points pertaining only to the background color, i.e., the color of the paper on which the image is printed. These teachings are simply not related to the features recited in Applicants' claims.

In light of the true scope and content of the Schoenenberg et al., Applicants respectfully submit that one of ordinary skill in the art would have found no teaching that would have even remotely suggested the desirability of modification of Engeldrum et al. to arrive at the claimed invention. Again, Schoenenberg et al. merely describes the determination of a reference value for a piece of paper that happens to have a green background color. Applicants respectfully submit that this aspect of Schoenenberg et al. bears no relationship to the requirements of Applicants' claims.

With the content of Schoenenberg et al. focused on determination of reference values for document background colors, it is difficult to imagine how one of ordinary skill in the art could have found any teaching that would have suggested estimation of an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background. Notably, Schoenenberg et al. appears to make reference to "gamma" only a single time, at Col. 9, lines 4-9, and only in the context of general gamma correction that is conventionally applied to scanned images.

In the absence of a pertinent prior art teaching, the Examiner generally dismissed the requirement of a "dithered green background" in Applicants' claims on the basis of lack of criticality. The Examiner's assertion that "criticality of using the dithered green background was not shown in the specification, drawings or claims" is misplaced for many reasons. First, to establish a prima facie case of unpatentability, the Examiner cannot merely allege lack of criticality to bridge a gap between the disparate teachings of two references. The Examiner still

must provide a reason from some teaching, suggestion or implication in the prior art, as to why one of ordinary skill in the art would have pursued modification to arrive at the claimed invention. Here, that motivation is entirely lacking. A vague desire "to display color images accurately and clearly" is universal in the imaging arts, and sheds no light on the desirability of the precise modifications necessary to arrive at the claimed invention.

Second, even if a discussion of criticality were applicable, the Examiner's assertion is factually incorrect. The desirability of the use of a dithered green background pervades Applicants' disclosure, including the specification, drawings and claims. Indeed, this very feature is set forth in every single independent claim in the application. The importance of the green dithered background is in stark contrast to a mere nested range of values to which criticality inquiries are usually directed. Rather, the green dithered background is a key feature in the estimation of the initial gamma. After all, it would seem to make no sense to select a green element that appears to most closely blend with a dithered red or blue background. The point is that the initial gamma is based on the green color channel, yet that initial gamma is used as the basis for an overall gamma applicable to the red and blue color channels as well.

The benefits of estimating initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background are discussed throughout the disclosure in terms of simplifying the gamma estimation process for a user, reducing user error, and reducing the number of steps required for gamma estimation. If it is only necessary to estimate initial gamma based on the green color channel, there may be no need to carry out the same process for the red and blue channels. Rather, the initial gamma from the green channel may be used for the all channels, subject to possible modification of overall gamma based on a gray balance evaluation for the red and blue channels. Accordingly, the Examiner's summary dismissal of this feature as lacking criticality is entirely misplaced, in terms of both legal and factual correctness, and highlights the clear deficiencies in the prior art made of record.

In view of the lack of any pertinent teaching that would have suggested modification of Engeldrum et al. to estimate of an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background, the rejection is improper and should be withdrawn.

**modification of overall gamma based on
gray balance evaluation for R and B channels**

In his analysis, the Examiner asserted that Engeldrum et al. discloses modifying overall gamma based on a gray balance evaluation for the red and blue channels and pointed to FIG. 5, items 500, 102, 206, and Col. 3, lines 50-63. Once again, Applicants point out that Engeldrum et al. does not disclose characterization of overall gamma for the red, green and blue color channels, whether that overall gamma is based on the gamma estimated from a selected green element or not. Rather, Engeldrum et al. describes determination of separate gammas for the red, green and blue color channels. Consequently, in the absence of an overall gamma, there is no way Engeldrum et al. could have further suggested modification of the overall gamma based on a gray balance evaluation for the red and blue channels, as claimed.

As discussed above, Engeldrum does not even produce a characterization of overall gamma. Instead, Engeldrum et al. makes separate gamma determinations. Hence, to the extent Engeldrum et al. would describe any modifications based on gray balance, such modifications are necessarily made with respect to the separate gammas, rather than on the basis of an overall gamma for the red, green and blue channels, as claimed by Applicants. In view of this added difference, the rejection is improper and should be withdrawn.

Dependent Claims

The references applied by the Examiner also fail to disclose or suggest numerous additional features set forth in Applicants' dependent claims. For the sake of brevity, and in light of the clear prior art deficiencies already identified above with respect to the independent claims, Applicants briefly touch on some of the additional features below for purposes of illustration. At the same time, however, Applicants in no way acquiesce in the propriety of the Examiner's rejections with respect to the dependent claims, either in the Examiner's interpretation of the claims or factual findings with respect to the scope and content of the prior art.

As a first example, claims 4 and 5 require estimating both a coarse gamma and a fine gamma based on selection of one of a first and second plurality, respectively, of green elements that appears to most closely blend with a dithered green background, wherein the second plurality

of green elements includes the green element selected from the first plurality of green elements. The prior art fails to suggest such features. In the Office Action, the Examiner acknowledged that Engeldrum et al. and Schonenberg et al. do not teach a fine gamma estimation as defined by claims 4 and 5, but reasoned that "one of ordinary skill in the art would recognize that the first and second plurality of green elements only different [sic] in the scale of gradations, therefore will required [sic] no new approach." This observation by the Examiner amounts to an unsupported allegation of common knowledge in the art, which finds no basis in any substantial evidence in the record, and is therefore wholly improper.

As a second example, claim 13 specifies that the dithered green background of claim 1 is a dithered approximately 33% green background. In the Office Action, the Examiner acknowledged that Engeldrum et al. and Schonenberg et al. lack such a teaching, but stated that "one of ordinary skill in the art will recognize that any value of green background would be assigned for the testing and characterization, including 33% green background." Once again, the Examiner pointed to the vague motivation that such a modification would enable one "to display image accurately and clearly." This general allegation is entirely unsupported by substantial evidence in the record, and is therefore improper.

In general, for at least the reasons expressed in this Amendment, the Examiner has not established a prima facie case of unpatentability with respect to the pending claims. Therefore, the rejections under section 103 are improper and must be withdrawn.

Examiner's Assertions with respect to 37 C.F.R. 1.111(b)

At the close of the Office Action, the Examiner stated that Applicants' previous arguments fail to comply with 37 C.F.R. 1.111(b) "because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references." Applicants strongly object to the Examiner's assertion.

In the previous response filed January 17, 2003, Applicants explained in great detail the requirements of the claims and the particular deficiencies in the prior art relative to those claims. In particular, Applicants highlighted specific features expressly recited in the claims and explained how those features were lacking in the Engeldrum and Hill references. Indeed, some

of Applicants' arguments are reiterated in this response as the Examiner did not address them in the latest Office Action. Accordingly, it is unclear how the Examiner could possibly conclude that Applicants' previous Amendment was not in compliance with the requirements of 37 C.F.R. 1.111(b).

Examiner's Assertions with respect to Arguments Against Individual References

The Examiner further asserted that Applicants' arguments were inappropriately made against the references individually rather than combinations of those references. Once again, this assertion does not seem to reflect the factual reality of the record. In the previous Amendment, Applicants explained in detail the deficiencies in the references, including lack of disclosure of particular features, and lack of any teaching that would have suggested the desirability of modification to incorporate such features, i.e., lack of motivation to make the combinations proposed by the Examiner.

CONCLUSION

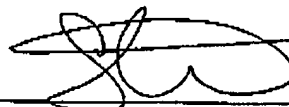
All claims in this application are in condition for allowance. Applicants respectfully request reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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11-6-03

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